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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/867,606	05/31/2001	Ib Johannsen	0459-0611P	7054

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HARNESS, DICKEY & PIERCE, P.L.C.  
P.O. BOX 8910  
RESTON, VA 20195

EXAMINER

ENSEY, BRIAN

ART UNIT	PAPER NUMBER
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2643

DATE MAILED: 04/27/2004

16

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/867,606

Applicant(s)

JOHANNSEN ET AL.

Examiner

Brian Ensey

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 23 February 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 23-43 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 23-43 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

2. Claims 23-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Loeppert et al., U.S. Patent No. 5,870,482 in view of Sprenkels et al., U.S. Patent No. 4,910,840.

Regarding claim 21 (Currently Amended) and 30-36 (original), Loeppert discloses a condenser microphone comprising a diaphragm (12) and a back-plate (14b), wherein an inner surface of said diaphragm forms a capacitor in combination with an inner surface of said back-plate, said back-plate and/or said diaphragm is/are provided with a number of openings (72), and wherein the static distance between said diaphragm and said back-plate is smaller than 10  $\mu\text{m}$  (See Figs. 1, 5, 9 and col. 3, line 44 through col. 6, line 25 and col. 9, lines 32-33). Loeppert does not expressly disclose the inner surfaces of the back-plate and said inner surface of the diaphragm being provided with a hydrophobic layer. However, the use of hydrophobic layers in acoustic transducers is well-known in the art and Sprenkels teaches the use of a hydrophobic

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layer in a microphone transducer apparatus to prevent the absorption of water molecules or water ions from ambient air. It would have been obvious to one of ordinary skill in the art at the time of the invention to provide a hydrophobic layer to prevent reduced operating capabilities of the transducer due to humid or wet conditions.

Regarding claim 24 (original), Loeppert does not expressly disclose at least the inner surfaces of the diaphragm and back-plate are made from a hydrophilic material. However, hydrophilic material is well-known for absorbing water. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use hydrophilic material for the underwater application.

Regarding claims 25-29 (original), Loeppert also teaches the smallest dimension of each of the openings (See col. 9, lines 27-58).

Regarding claims 37 and 38, Loeppert does not expressly disclose a contact angle for contact angle of water. Sprenkles teaches a hydrophobic layer but does not expressly limit any contact layer for water. It would have been obvious to one of ordinary skill in the art at the time of the invention to change the contact angle for water for preventing moisture interference in transducer operation.

Regarding claims 39-41, Loeppert does not expressly disclose a temperature range for a hydrophobic layer. Sprenkles teaches a hydrophobic layer but does not express a temperature range for the hydrophobic layer. Moreover, the operating temperature range for the condenser microphone is well known. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the temperature range for operating the condenser microphone.

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Regarding claim 42 (New), Loeppert discloses a condenser microphone comprising a diaphragm and a back-plate, wherein an inner surface of said diaphragm forms a capacitor in combination with an inner surface of said back-plate, said back-plate and/or said diaphragm is/are provided with a number of openings, and said inner surfaces of the back-plate, wherein the static distance between said diaphragm and said back-plate is smaller than 10  $\mu\text{m}$ . Loeppert does not expressly disclose said inner surface of the diaphragm being provided with a hydrophobic layer having a contact angle for water being larger than  $90^0$ . However, the use of hydrophobic layers in acoustic transducers is well-known in the art and Sprenkels teaches the use of a hydrophobic layer in a microphone transducer apparatus to prevent the absorption of water molecules or water ions from ambient air. It would have been obvious to one of ordinary skill in the art at the time of the invention to provide a hydrophobic layer to prevent reduced operating capabilities of the transducer due to humid or wet conditions. Additionally, Sprenkles teaches a hydrophobic layer but does not expressly limit any contact layer for water. It would have been obvious to one of ordinary skill in the art at the time of the invention to change the contact angle for water for preventing moisture interference in transducer operation.

Regarding claim 43 (New), Loeppert discloses a condenser microphone comprising: a diaphragm; a back-plate, wherein an inner surface of said diaphragm forms a capacitor in combination with an inner surface of said back-plate, said back-plate and/or said diaphragm is/are provided with a number of openings, wherein the static distance between said diaphragm and said back-plate is smaller than 10  $\mu\text{m}$ . Loeppert does not expressly disclose a hydrophobic layer, provided on said inner surfaces of the back-plate and said inner surface of the diaphragm. However, the use of hydrophobic layers in acoustic transducers is well-known in the art and

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Sprenkels teaches the use of a hydrophobic layer in a microphone transducer apparatus to prevent the absorption of water molecules or water ions from ambient air. It would have been obvious to one of ordinary skill in the art at the time of the invention to provide a hydrophobic layer to prevent reduced operating capabilities of the transducer due to humid or wet conditions.

### *Conclusion*

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian Ensey whose telephone number is 703-305-7363. The examiner can normally be reached on Mon-Fri: 8:00 - 4:30.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Curtis Kuntz can be reached on 703-305-4708. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

**Any response to this action should be mailed to:**

Commissioner of Patents and Trademarks  
Washington, D.C. 20231

**Or faxed to:**

(703) 872-9306, for formal communications intended for entry and for informal or draft communications, please label "PROPOSED" or "DRAFT".

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA., Sixth Floor (Receptionist).

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

BKE  
April 20, 2004

  
CURTIS KUNTZ  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2600